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Barriers to Entry, Concentration, and Tobin's q Ratio

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Abstract

In a well-developed capital market, rents will be capitalized in the prices of the firm's outstanding securities. To avoid the difficulties of using accounting rates of return to measure rents, we use capitalized market values in relation to the replacement cost of the firm's capital stock, a measure known as "Tobin's q." Following Bain's and other more recent entry barrier classifications, we find q ratios significantly above unity for only the "very high" barrier. Further, we find the aforementioned classification scheme of entry barriers much more useful than concentration ratio in describing cross-sectional variation in q ratios. Only for the very high barrier group has concentration ratio added any explanatory power and the observed relationship is negative.

Barriers to Entry, Concentration, and Tobin's q Ratio

I. Introduction

One of the central issues in industrial organization is the relationship between concentration and excess returns. One line of reasoning holds that concentration fosters collusion and allows firms to earn monopoly rents. The empirical evidence of the association between measures of concentration and excess returns is mixed leaving no consensus about the strength of the association.[1]

Concentration is a necessary, but not sufficient, condition for above normal rates of return. It is easy to imagine technological, cost, and demand conditions that result in industry demand being satisfied by one or a few producers. If there were no barriers to entry, extant producers would earn only normal returns even though the industry might be viewed as "concentrated."

Another line of reasoning attributed by Bain (1956) holds that in the absence of barriers to entry oligopolists may practice limit pricing to discourage entry. With low barriers to entry, the industry price would approach the competitive price and generate no excess returns for producers even in the presence of seller concentration. At the other extreme with very high barriers to entry, Bain conjectured that the limit price would approach the monopoly price. Thus, Bain hypothesized a direct relationship between the magnitude of entry barriers and profit rates. The role of seller concentration is a subordinate one: given high barriers to entry the additional influence of concentration is to foster collusion and cooperative pricing.

The purpose of this paper is twofold. First, we investigate whether the classification scheme of entry barriers provided by Bain (1956), Mann (1966, 1970), Shephard (1970), and Palmer (1974) are associated with cross-sectional excess returns. Second, we seek to determine if entry barrier classifications are more useful than concentration in explaining excess returns.

Previous work along these lines has relied on accounting data and periodic rate of return data. Since accounting income is not a concept closely related to economic income and since periodic income is short-run in nature, we prefer to use the capitalized values of rents as measured by Tobin's q ratios. Using capital market prices we find that industries previously classified as having "very high" barriers to entry do indeed earn above normal returns. Firms in industries classified as having "substantial" or "low to moderate" barriers earn normal returns. Furthermore we find that published entry barrier classifications are better predictors of capitalized rents than concentration ratios. The only significant relationship between capitalized rents and concentration occurs in the very high entry barrier group and the relationship is negative instead of positive.

The rest of the paper is organized as follows. Section II provides the rationale for using capitalized values to measure monopoly rents so as to avoid using accounting rate of return measures. Section III describes the data, the estimation of Tobin's q ratios, and the published classifications of industries by barriers to entry. The methodology and empirical results are presented in Section IV. Concluding remarks are presented in Section V.

II. Rationale for Using Capital Market Data

A particularly thorny empirical issue is how to measure excess returns on monopoly rents. Many earlier attempts have used accounting rates of return, e.g., the ratio of accounting income to the book value of total assets or equity. Accounting rates of return present three problems: (1) they are not economic rates of return, (2) they reflect past information instead of looking to the future, and (3) they are not adjusted for risk to account for differential risk premia embedded in market-determined opportunity costs.

The failure of accounting rates of return to correspond to a meaningful measure of the economic rate of return is well-documented in Fisher and McGowan (1983). Accounting income is the product of a set of arbitrary rules for revenue and expense recognition and cost allocations that leave individual firms a degree of latitude in their reporting procedures. Asset values reflect historical costs less allocated depreciation charges instead of replacement cost. Similarly, inventory valuation procedures bear little resemblance to replacement cost. With both the numerator (income) and denominator (assets) subject to question, one can put little faith in the rate of return ratio.

The second problem is that accounting rates of return are historical in nature and may not be indicative of long-run equilibrium conditions. For example, an increase in demand may allow existing firms to earn above competitive returns that are competed away as entry occurs. Short-run rates of return would not capture the effect of future entry. On the other hand, profitable future growth opportunities would not be reflected in current rate of return data. Even averaging of the data over just a

few years may not reflect a firm's ability to exercise and protect its market power in the long-run.

The third problem is that accounting rates of return fail to account for risk-adjusted opportunity costs. That is, even if accounting data adequately proxied for the true rate of return one would still need a benchmark, or "normal," rate of return to measure monopoly returns. If we define ρ_j as the true rate of return on capital for firm j and r_j as the capital market opportunity cost for investments in the same risk class as firm j, the measure of excess return, or "spread," is

$$\theta_j = \rho_j - r_j. \tag{1}$$

Thus to use rate of return data one must separately estimate the risk-adjusted normal rate of return, r_j. Even with a model of capital market equilibrium such as the capital asset pricing model of Sharpe (1964), Lintner (1965), and Mossin (1966) this is no trivial task.

To overcome the difficulties of using rate of return data we use capital market values of the firm to measure rents. To see the relationship, assume for simplicity that the firm is expected to earn the rate of return ρ_j in perpetuity, the replacement cost of the capital stock is K_j, and the risk-adjusted opportunity cost r_j is constant through time. In this simple perpetuity case,[2] the value of the firm, denoted V_j, is given by

$$V_j = \frac{\rho_j K_j}{r_j} \tag{2}$$

or

$$V_j = K_j + \frac{\rho_j - r_j}{r_j} K_j. \tag{2'}$$

Thus the value of the firm is the sum of the value of its capital stock and the discounted value of any rents it earns. Expressing the value of the firm as a ratio to the replacement cost of its capital stock, we have a measure known as "Tobin's q,"

$$q_j \equiv \frac{V_j}{K_j} = 1 + \frac{\rho_j - r_j}{r_j}. \tag{3}$$

The amount by which q_j exceeds unity serves as a measure of capitalized rents.

This measure was identified by Tobin (1969, 1978) and Tobin and Brainard (1968, 1977) in connection with monetary policy/control as the nexus between financial markets and the markets for goods and services. Recently, Lindenberg and Ross (1981) have used Tobin's q as a measure of monopoly rents. The essence of their argument is that for competitive firms, one would expect q to be close to unity. A q ratio above unity would in the absence of barriers to entry attract new entrants, driving q in the direction of unity. On the other hand, a monopolist protected by barriers to entry would have any monopoly rents capitalized, the market value of the firm would exceed the replacement cost of its capital stock, and q would persist above unity.

The use of capitalized market values avoids the three problems associated with periodic accounting rates of return. Market values are objective values free of accounting procedures, they reflect expectations about long-run industry entry conditions, and they are risk-adjusted present values. Consequently, our tests of the relationship between

entry barriers and the ability of firms in high barrier industries to earn rents should be more powerful.

While the market values used in the numerator of the q ratio present no difficulty, the replacement cost of the capital stock in the denominator is more troublesome. Firms may possess firm-specific resources that are valuable for their cost-reducing capabilities. To the extent that these resources are not carried on the books of the company, the replacement cost of the capital stock will be understated. The returns to these specialized resources will generate ordinary Ricardian rents that will be capitalized in the market value of the firm. Thus, the q ratio will reflect both these rents and any monopoly rents the firm earns. Consequently the excess of q above unity will provide only an upper bound on the magnitude of monopoly rents and will coincide exactly with monopoly rents only in the absence of Ricardian rents.

III. Estimations of Variables and the Data

A. Calculating Tobin's q Ratio

The firm's q ratio is the ratio of the firm's market value to the replacement cost of its assets. The market value of the firm is the sum of three components: common stock, preferred stock, and debt. Assets may also be subdivided into three components: plant and equipment, inventory, and other assets. In measuring q ratios, we rely primarily upon the methodology of Lindenberg and Ross (1981), who have described their computational procedures in detail.

Market value of common stock at year end prices is readily available, however "Compustat" provides only the book value of preferred stock. To

approximate the market value of preferred stock, preferred dividends for the year are divided by Standard and Poor's preferred stock yield index.

Calculating the market value of debt, given only book values, is more difficult. To do so, we assume that all bonds have a 20-year maturity, and offer a yield equal to the corporate average (at the time of issuance) for new issues of its rating. Using the method of Lindenberg and Ross, we can approximate the fractions of total debt which were issued in each of the preceeding 20 years.[3] The present value of debt issued in each of those years can then be calculated straightforwardly, given knowledge of the yield of those bonds and the current yield on bonds of identical rating.[4]

For the denominator of q, we must calculate the replacement costs of capital assets. To calculate the replacement cost series for plant and equipment, we assume that in 1963, our base year, the replacement cost of plant and equipment was equal to the book value of net plant and equipment. For succeeding years, we adjust replacement cost to account for new investment, depreciation, and inflation, according to the following formula:[5]

$$RCP_t = RCP_{t-1}\left(\frac{1 + \phi_t}{1 + \delta_t}\right) + I_t \qquad t = 1964,\ldots,1976 \qquad (4)$$

RCP = Replacement cost of plant and equipment.

ϕ = Rate of growth of capital goods prices (calculated from the price deflator for the fixed investment component of GNP).

δ = Rate of depreciation (assumed fixed at .05).

I = Investment in new plant and equipment.

The depreciation rate of 5% is arbitrary, but conforms to the choice of Tobin and Brainard (1977).

We have again followed the example of Ross and Lindenberg in adjusting book value of inventory to reflect replacement costs. Adjustments are made to account for the tendency of some inventory valuation procedures to understate replacement costs in inflationary times. The specific adjustments made depend upon the choice of inventory valuation method chosen by the individual firms.[6]

The category "other" assets includes liquid assets, land, and intangibles. Out of necessity we assume that the replacement costs of assets in this category are equal to reported book values.

Tobin's q may now be computed as the ratio of total market value (of common stock, preferred stock and debt) to replacement costs (of plant and equipment, inventories, and other assets). For the firms in our sample, we have computed q ratios for each year from 1963 to 1976.[7]

B. Barrier to Entry Classifications

We are interested in the relationship between capitalized rents and the height of barriers to entry. Entry conditions determine the extent to which existing firms can collectively exercise market power without inducing a response from potential competitors. In the absence to entry barriers, monopoly power cannot persist in the long run.

To assess the extent of entry barriers we rely upon earlier studies. The seminal work of Bain (1956) classified a sample of 20 manufacturing industries into three barrier categories: low-moderate, substantial, and very high barriers to entry. This classification scheme has been

extended and updated by Shephard (1970), Mann (1966, 1970) and Palmer (1974). Since these data have been widely studied in previous market structure/profits studies, their use will allow comparison of our results to earlier work. Thus we take the data as given and do not attempt verification or modification of the industry classifications. Appendix A contains the list of industries and barrier categories.

C. Sample

The sample consists of 127 firms taken from Standard and Poor's "Compustat" file. To be included, a firm must have sufficient data for the years 1963 to 1976 to compute q ratios and it must be in an industry for which we are able to obtain a barrier to entry classification from the previously cited sources.

IV. Empirical Results

Before testing the formal hypotheses, we present the average q ratios for each entry barrier category in Table 1. The point estimates for 1972 are .965 for the low-moderate barrier (LMB) group, 1.068 for the substantial barrier (SB) group, and 2.868 for the very high barrier (VHB) group. Using individual firm averages for the period 1963-76, the group means are .943, 1.062, and 2.467, respectively. (Henceforth, only the 1972 estimates are discussed due to the consistency of the 1963-76 average estimates. Both are reported in the accompanying tables, however.)

Insert Table 1

The formal hypothesis states that the LMB should have q ratios close to unity and that q should increase with the height of barriers to entry. Table 2 reports the results of the regression of q on barrier to entry dummy variables D_1 for the SB group and D_2 for the VHB group. The intercept $\hat{\alpha}_0$ is not significantly different from unity as predicted. For the SB group $\hat{\alpha}_1$ is positive but insignificant indicating no significant difference in q ratios for the LMB and SB groups. For the VHB group the coefficient $\hat{\alpha}_2$ is significant at the 1% level. The highest barrier group is distinct from the other two groups in that the q ratios for this group are significantly above unity. The barrier classifications explain 31.9% of the cross-sectional variation in q ratios which is significant at the 1% level.

Insert Table 2

While the barrier classifications have significant explanatory power, one might expect that barriers are also associated with seller concentration. The natural question is whether the barrier groupings are more closely associated with q than measures of seller concentration. A commonly used measure of concentration is the 4-firm, 4-digit concentration ratio which is the percentage of the value of total industry shipments accounted for by the four largest firms. Using 1972 concentration data we regress q against the concentration ratio and report the results in Table 3.

Insert Table 3

In the first specification, we test for a linear relationship with the concentration ratio (CR) measured as a continuous variable. The continuous CR variable has insignificant explanatory power and accounts for only 1.0% of the variation in q.[8]

Of course, there is no reason to believe that a continuous concentration measure captures the underlying relationship. Meehan and Duchesneau (1973) report evidence of a "critical level" of concentration above which greater concentration has no effect. Using a cut-off of CR $\leq$ 50% we partitioned our sample into two approximately equal subsamples. The second set of regressions in Table 3 include a dummy variable for the high concentration group. The dichotomous concentration measure shows a positive but insignificant association with q and produces results no better than the continuous concentration measure.[9]

At this point we must conclude that concentration ratios show no significant association with the capitalized values of rents. This is in sharp contrast to the strong association we find for the entry barrier classifications. While concentration ratios offer no explanatory power across the broad sample this does not rule out the possibility of significant influences within separate barrier categories.

Table 4 presents a two-way analysis of variance using the three barrier categories and the two concentration categories. As expected the barrier effect is significant but the concentration effect is not. More importantly the interaction term between barriers and concentration is significant and adds to the explanatory power of the statistical model.

Insert Table 4

To investigate the interaction effect more thoroughly we estimate the regression reported in Table 5 which includes the barrier dummy variables and the interaction terms which are the products of the barrier variables and the continuous concentration variables. The coefficients for the interaction terms are negative for all three barrier groups. For the LMB and SB groups the interaction is insignificant but for the VHB group it is negative and significant at the 1% level. The inclusion of the interaction terms improves the explanatory power of the model.

Insert Table 5

The results in Table 5 confirm that the VHB group is distinct from the lower barrier groups. First, the highest barrier group is the only group which shows q ratios significantly above one, i.e., market values well in excess of the replacement cost of the capital stock. Second, it is the only group which shows any significant effect of concentration. Interestingly, high concentration has a negative association with profitability in the high barrier group of firms.

V. Summary and Conclusions

Earlier concentration/profits studies have relied on accounting rate of return data which may not correspond with economic rates of return. In this paper, we use capitalized market values which correspond more closely to economic concepts. In addition, in an efficient capital market these values will reflect long-run above normal returns and require no adjustment for risk. Expressing the value of the firm

as a ratio to the replacement cost of the capital stock, a Tobin's q ratio, we are able to place an upper bound on monopoly rents.

Empirically, we find a very strong relationship between published barrier to entry categories and Tobin's q ratios for our sample of 127 firms. By contrast, we find virtually no statistical association between q ratios and concentration measured either as a continuous variable or as a critical threshold dichotomous variable. The only significant relationship we found for concentration, is that for the very high barrier to entry class q ratios decline with concentration.

The magnitudes of the q ratios are interesting as well. In a competitive industry with no barriers to entry we would expect q to tend towards unity. For the low to moderate entry group the average q is not significantly different from unity which provides a check of the computational methods. The substantial barrier to entry group have slightly higher q ratios but the increase is insignificant. Only the very high barrier group have q ratios significantly above unity. The average q for this group is 2.868.

One must be careful in interpreting the excess of the q ratio above unity as a measure of monopoly rents. To the extent that these firms possess specialized resources whose values are not capitalized on the books of the firm but which are capitalized by the capital market, q will reflect both monopoly and Ricardian rents. At best q is an upper bound on monopoly rents. Nevertheless the average q of 2.868 for the very high barrier group is extraordinary. This implies that the replacement cost of the capital stock is a mere 35% of the total market value. Uncapitalized resources would have to account for an incredible 65% of

the typical firm's value to suggest that a q ratio of 2.868 does not reflect the presence of any monopoly rents. Furthermore, we are hard pressed to explain why such significant omissions of Ricardian factors are present only in industries classified by Bain, Shephard, Mann, and Palmer as having very high entry barriers. Instead we interpret our findings as showing at least some monopoly rents accruing to firms in the highest barrier group.

Our findings would seem to have some bearing for antitrust enforcement. Measures of concentration do not serve as accurate indicators of the ability of firms to earn monopoly returns as measured by capitalized market values. There is no statistical association to support the view that high concentration and high long-run profits are associated. In fact, we find capitalized rents only in the very high barrier group in which concentration has a negative and significant statistical association with q ratios.[10]

FOOTNOTES

[1] For a comprehensive review of this literature see Weiss (1974) and Scherer (1980).

[2] The level perpetuity case is used solely for expositional convenience. In an efficient capital market the value of the firm will reflect future returns regardless of the pattern of cashflows or growth opportunities. See Miller and Modigliani (1961).

[3] The book value of new long-term debt issued in year t can be calculated as follows:

$$N_t = \begin{cases} LD_t - LD_{t-1} + RD_t, & \text{if } LD_t - LD_{t-1} + RD_t \geq 0 \\ 0, & \text{if } LD_t - LD_{t-1} + RD_t < 0 \end{cases}$$

where N_t = Book value of long-term debt issued in year t.

LD_t = Book value of total long-term debt outstanding in year t.

RD_t = Amount of long-term debt retired in year t.

The fraction of total long-term debt outstanding in year t which was issued in year t-j is therefore given by $F_{t,t-j}$:

$$F_{t,t-j} = \frac{N_{t-1}}{\sum_{k=0}^{18} N_{t-k}}, \qquad j = 1,\ldots,18$$

Note that debt issued in year t - 19 is classified as current rather than long-term debt in year t.

[4] The market value at time t of all outstanding debt is given by the formula below:

$$MVD_t = DS_t + DL_t \sum_{j=0}^{18} F_{t,t-j}[(b_{t-j}/b_t)(1 - (1 + b_t)^{-(20-j)})$$

$$+ (1 + b_t)^{-(20-j)}]$$

where MVD_t = The market value of outstanding debt at time t.

DS_t = The book value of short-term debt.

DL_t = The book value of outstanding long-term debt at time t.

b_t = The yield on corporate bonds of the appropriate rating issued at time t.

$F_{t,t-j}$ = The fraction of total long-term debt outstanding in year t which was issued in year t-j.

[5]Our method of estimating the replacement cost of assets differs from that of Lindenberg-Ross, who made corrections to account for technical obsolence as well as ordinary depreciation. They also relied on accounting data to estimate depreciation rates, rather than assuming a uniform depreciation rate.

[6]According to the LIFO (last in-first out) valuation, it is assumed that output sold is that most recently purchased (or produced). Hence the reported value of inventories will be understated in times of persistent inflation. We make the following adjustment:

$$RINV_t = RINV_{t-1}\left(\frac{P_t}{P_{t-1}}\right) + (BI_t - BI_{t-1}) \cdot \left(\frac{.5(P_t + P_{t-1})}{P_{t-1}}\right)$$

where RINV = Replacement cost of inventory.

P = The wholesale price index.

BI = Book value of inventory.

According to the average cost valuation method, inventories at time t are reported in terms of prices which, according to Lindenberg-Ross (1981, p. 15) are "roughly an averagae of prices at t-1 and t." Thus, the following correction is made:

$$RINV_t = BI_t\left(\frac{P_t}{.5(P_t + P_{t-1})}\right)$$

No corrections are made for other inventory valuation methods.

[7]Tobin's q ratios have been kindly provided to us by Chappell and Cheng (1982).

[8]This finding is consistent with Lindenberg and Ross (1981), and Smirlock, Gilligan, and Marshall (1983). We also tested for a quadratic relationship and found no improvement in the regression results.

[9]We tried other critical concentration cut-off points with no improvement.

[10]Traditionally, concentration is alleged to reduce the cost of collusion and cooperative pricing. Under this traditional hypothesis it would seem that concentration should have a positive effect on profits that is most easily detected in the high barrier group least threatened by potential entrants. For other evidence inconsistent with the traditional hypothesis see Lindenberg and Ross (1981), and Smirlock, Gilligan, and Marshall (1983).

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APPENDIX A

List of Industries and Barrier Categories

	# of Firms
Low Barrier to Entry	
Meatpacking	3
Canned fruits and vegetables	4
Woolen and cotton textiles	5
Clothing	6
Wooden furniture	3
Paperboard products	15
Footwear	3
Cement	4
	43
Moderately-High Barrier to Entry	
Sugar	2
Lumber	6
Inorganic chemical	2
Petroleum refining	13
Aluminum	7
Gypsum products	1
Large household appliances	4
Synthetic rubber	4
Construction machinery	6
	45
High Barrier to Entry	
Distilled liquors	4
Ethical drugs	9
Soaps	4
Newspapers	1
Flat glass	2
Computing and relating machines	10
Industrial controls	2
Automobiles	4
Photographic equipment	3
	39

Table 1

Average q-Ratios[†] for Overall Sample and by Barrier to Entry Classification (1972 Estimates and 1963-76 Average Estimates)

Estimation Period	Overall Sample (N=127)	Low-Moderate Entry Barriers (N=43)	Substantial Entry Barriers (N=45)	Very High Entry Barriers (N=39)
1972	1.586	.965 (.447)	1.068 (.681)	2.868 (2.078)
1963-76 (average)	1.454	.943 (.312)	1.062 (.439)	2.467 (1.561)

[†]Cross-sectional standard deviations in parentheses.

Table 2

Dummy Variable Regression Results[†] for q versus Barriers to Entry

Model: $q = \alpha_0 + \alpha_1 D_1 + \alpha_2 D_2 + \varepsilon$

where $D_1 = \begin{cases} 1 \text{ if substantial barriers to entry} \\ 0 \text{ otherwise} \end{cases}$

$D_2 = \begin{cases} 1 \text{ if very high barrier to entry} \\ 0 \text{ otherwise} \end{cases}$

Estimation Period	$\hat{\alpha}_0$	$\hat{\alpha}_1$	$\hat{\alpha}_2$	R^2	F
1972	.965 (5.01)**	.102 (.38)	1.903 (6.81)**	.319	29.06**
1963-76 (average)	.943 (6.63)**	.119 (.60)	1.524 (7.39)**	.350	33.44**

[†] t-statistics in parentheses.
**significance level exceeds 1%.

Table 3

Regression Results[†] for q versus Four Firm Concentration Ratios

Model 1: $q = \alpha_0 + \alpha_1 CR + \varepsilon$

Model 2: $q = \alpha_0 + \alpha_1 D_1 + \varepsilon$

where

$$D_1 = \begin{cases} 1 \text{ if } CR > 50\% \ (N=65) \\ 0 \text{ if } CR \leq 50\% \ (N=62) \end{cases}$$

Model	Estimation Period	$\hat{\alpha}_0$	$\hat{\alpha}_1$	R^2	F
1	1972	1.197 (3.17)**	.805 (1.10)	.010	1.21
	1963-76 (average)	1.004 (3.54)**	.930 (1.70)	.023	2.88
2	1972	1.544 (8.16)**	.087 (0.32)	.001	.10
	1963-76 (average)	1.380 (9.67)**	.152 (0.74)	.004	.55

[†] t-statistics in parentheses.

**significance level exceeds 1%.

Table 4

Two Way ANOVA for Effects of Entry Barriers and Concentration on q-Ratios

		Average q-Ratios		
Barrier Class	Concentration Class	1974	1963-76 (average)	N
Low-Moderate	CR < 50%	.979	.957	39
	CR > 50%	.835	.811	4
Substantial	CR < 50%	.977	.990	15
	CR > 50%	1.112	1.099	30
Very High	CR < 50%	4.319	3.410	11
	CR > 50%	2.299	2.098	28
	R^2	.43	.43	
	ANOVA F-ratios:			
	Overall	18.33**	18.51**	
	Barrier Effect	33.93**	37.41**	
	Concentration Effect	.17	.94	
	Interaction	11.80**	8.40**	

**Significance level greater than 1%.

Table 5

Regression Results[†] for q versus Entry Barriers and Four Firm Concentration Ratios

Model: $q = \alpha_0 + \alpha_1 D_1 + \alpha_2 D_2 + \alpha_3 D_0 \cdot CR + \alpha_4 D_1 \cdot CR + \alpha_5 D_2 \cdot CR + \varepsilon$

where

$$D_0 = \begin{cases} 1 & \text{if Low-Moderate Entry Barriers} \\ 0 & \text{otherwise} \end{cases}$$

$$D_1 = \begin{cases} 1 & \text{if Substantial Entry Barriers} \\ 0 & \text{otherwise} \end{cases}$$

$$D_2 = \begin{cases} 1 & \text{if Very High Entry Barriers} \\ 0 & \text{otherwise} \end{cases}$$

Estimation Period	$\hat{\alpha}_0$	$\hat{\alpha}_1$	$\hat{\alpha}_2$	$\hat{\alpha}_3$	$\hat{\alpha}_4$	$\hat{\alpha}_5$	R^2	F
1972	1.119	.052	5.431	-0.005	-0.002	-0.059	.45	19.63**
	(1.93)	(0.06)	(5.88)**	(-0.28)	(-0.18)	(-5.30)**		
1963-76	0.976	0.078	3.929	-0.001	0.000	-0.039	.45	19.70**
(Average)	(2.23)*	(0.12)	(5.63)**	(-0.08)	(0.02)	(-4.65)**		

† t-statistics in parentheses.
*significance level exceeds 5%.
**significance level exceeds 1%.